

ENVIRONMENTAL OUTCOME Watershed Assessment

Watersheds: San Joaquin River, Northeast Sub-basin (Cosumnes, Mokelumne, and Calaveras Rivers)

Sampling

Period: January – December 2002

Report

Objectives:

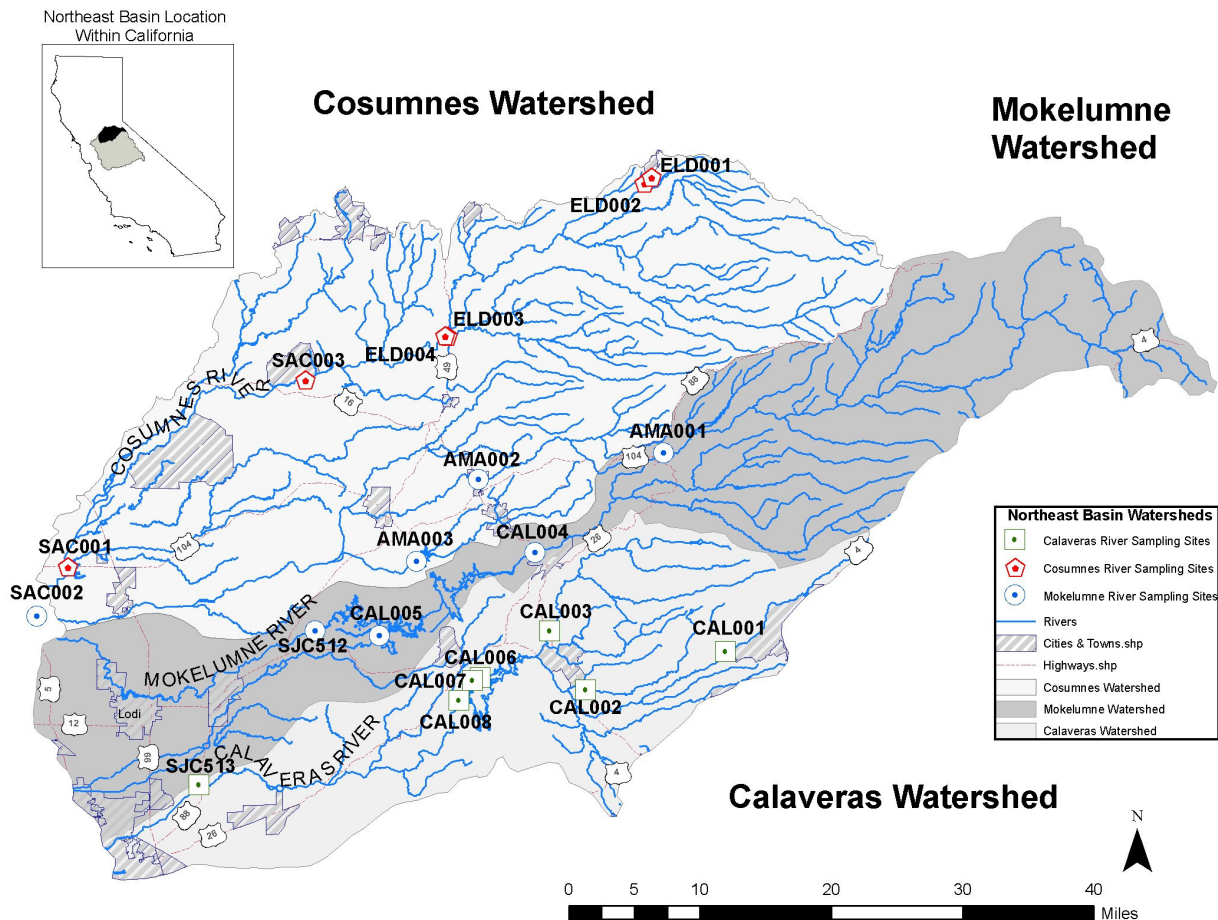
1. Spatial and Temporal Trends;
2. Potential Beneficial Use Concerns;
3. Planning for future monitoring program design

MESSAGE: Twelve months of water quality monitoring recorded both spatial and temporal trends in a drainage basin to the San Joaquin River.

KEY STATISTICS

Size of Northeast Sub-basin	4,360 Sq Mi
Number of sites Sampled	20
Number of Constituents measured	37
Samples Taken	~4900
Sample Frequency	Weekly to Annual

Site Locations:



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Table 1: Summary of Potential Beneficial Use Concerns: Northeast Basin of the San Joaquin River (January – December 2002)

Beneficial Use Indicator	Cosumnes Watershed	Mokelumne Watershed	Calaveras Watershed
Drinking Water			
Specific Conductivity			
Total Organic Carbon			
Trace Elements			
<i>E. coli</i>			
Nutrients			
Aquatic Life			
pH			
Temperature			
Dissolved Oxygen			
Turbidity			
Trace Elements			
Water Column Toxicity			
Irrigation Water Supply			
Specific Conductivity			
Recreation (Swimming)			
<i>E. coli</i>			

Yellow shaded cells indicate one or more result(s) above a water quality goal or objective.

WHAT IS THE MEASURE SHOWING?

The data gathered over a twelve month period provides information on the spatial and temporal trends in water quality from January – December 2002 and preliminary indications on the potential beneficial use impacts on the San Joaquin River. Results show that some constituents displayed distinct spatial and temporal patterns. For instance, temperature at all sites increased during the summer months regardless of flow and land use, as well as increased moving from upstream to downstream. Other constituents, such as specific conductance, TOC, and *E. coli* displayed seasonal patterns and were greatly influenced by storm events. The reservoirs appeared to stabilize some of the variability seen in the upper watershed sites, particularly in the ephemeral streams. Specific conductance (SC) in the Cosumnes Watershed tended to increase consistently moving downstream, while reservoirs in the Mokelumne and Calaveras Watersheds had lower overall SC than their tributaries, while the sites below the reservoirs reflected the reservoir concentrations. Table 1 identifies both indicators utilized and overall evaluation of potential beneficial use concerns.

WHY THIS INFORMATION IS IMPORTANT?

The San Joaquin River Watershed supports multiple beneficial uses (e.g. Drinking Water, Aquatic Life, Irrigation Water Supply and Recreation). Data collected as part of this study provided background water quality information for inflows to the San Joaquin River and was assessed in combination with other available data during the development of the Clean Water Act Sections 305(b) and 303(d) Integrated Report for the Central Valley Region (CVRWQCB, 2009), which assessed overall water quality within the Central Valley of California and also identified impaired waterbodies (water bodies not meeting their beneficial uses designations). The findings within this report can also help determine future program design by focusing resources toward identified concerns.

WHAT FACTORS INFLUENCE THE MEASURE?

Hydrology: Although the three watersheds in this Basin are similar in climate, geology, land use, and land cover, the Cosumnes and Mokelumne watersheds provided a unique opportunity to compare the effects of major impoundments on river systems. The Cosumnes River is the last river in California that does not have a major in-stream impoundment, while the Mokelumne represented a more typical current day watershed with reservoir regulated flows in the upper and lower portions of the watershed.

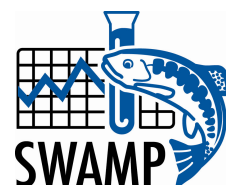
Land Use: The upper watershed areas supported gold mining activities in the mid 1800's. More common now is timber harvest activities, as well as developed areas and recreation. The lower watershed area is dominated by orchards and row crops, as well as urban and rural communities.

Water Year Type: A Water Year begins 1 October and ends 31 September of the following year. Because of the timing of this study, January – December 2002, Water Years 2002 and '03 were represented. The San Joaquin River Index, described in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (SWRCB, 1995) classified January – September 2002 "dry" and October – December 2002 "below normal".

TECHNICAL CONSIDERATIONS:



San Joaquin River Watershed Unit SWAMP



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- Data source: Central Valley Water Board SWAMP website at http://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_studies/surface_water_ambient_monitoring/northeast_basin_information/northeastsites.shtml.
- *E. coli* is only an indicator of potential pathogens and does not necessarily identify an immediate health concern.
- For selected constituents (e.g. water column toxicity, trace elements, and nutrients) limited funding only allowed monitoring for part of the 12 month sampling period.
- Public report and fact sheet are available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_studies/surface_water_ambient_monitoring/swamp_regionwide_activities/index.shtml

REFERENCES:

1. Central Valley Regional Water Quality Control Board (CVRWQCB). 2009. The 2008 Update to the 303(d) List and Development of the 2008 303(d)/305(b) Integrated Report.
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/impaired_waters_list/303d_list.shtml
2. Central Valley Regional Water Quality Control Board (CVRWQCB). 1998. The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region, 4th Edition, August 2006.
3. State Water Resources Control Board (SWRCB). 1995. Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.